Who Says You Don't Have The Room To Put Up a Long Antenna? Of Course You Do!

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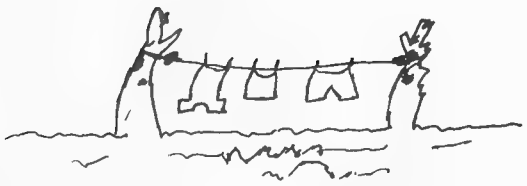

I seldom get on 80 or 40 metres without someone telling me he is using a dipole or inverted Vee antenna because he does not have room for a long-wire-type antenna. I believe part of the problem is in the terminology. Most amateurs think of a long-wire antenna as a single, end-fed, long wire. This is not one of the antennas I have in mind, because it has to be extremely long to achieve much gain, and it is unidirectional.

The antennas I have in mind are Vee-beams and rhombics. Both of these antennas are bidirectional as long as you do not use terminating resistors in them to make them unidirectional. Both of these antennas are also all-band antennas. The antennas in fig. 1 will work 160 metres and up and neither requires a lot longer than that required for an 80 metre dipole. A balanced antenna should be at least approximately one-half wavelength on the lowest frequency band for efficient operation on that band.

In these two antennas, for a given length in feet, the higher you go in frequency, the more gain you get. Of course, there is an optimum angle for each band for each length, but any given antenna will be usable on all bands and will give some gain on each band as long as the apex angle is between 32 degrees and 90 degrees. A short Vee-beam or rhombic will be closer to optimum on the higher bands if the angle is small and closer to optimum on the lower bands if the apex angle is large. A chart of gain and optimum apex angles is shown in Table I.

I have put up many of these antennas, using available trees in most cases. I do not worry too much about the apex angle. The antenna is still a usable antenna and a much better performer than a dipole or inverted Vee.

Yes, these antennas require the use of a tuner and open wire line, but you get some advantages:

1. All band operation.
2. Low feed line loss.
3. Due to higher impedance at the antenna feed point, on most bands, the RF voltage is higher and the amperage lower. This allows the use of light, inexpensive antenna wire and feed lines. I use 18 gauge steel core antenna wire 18 gauge (spaced one inch) 450 ohms open wire feed line, and usually a short piece of insulated open wire line as lead-in between window and windowsill.
4. An extremely good ground system is not needed as in the case with a vertical antenna.
5. The antenna is cheap.
6. The antenna is so light that it can be pulled up to tree-top height with a nylon string thrown over a tree limb.
7. Two antennas can work the world, especially if one is oriented northeast and southwest and the other northwest and southeast.
8. Separate antennas for high and low bands are not needed.

In summing up, it is hard to understand why two such antennas have largely been overlooked.

The Vee-beam is almost as easy to put up as a dipole. The rhombic is a little more trouble because it requires four supports and all four in about the right places. However, the rhombic does have slightly more gain for a given amount of wire and sometimes it is the more desirable on a narrow lot because the apex angle will be twice as large as on a Vee-beam erected on the same lot.

Try one of these antennas. You will like it. Remember, the longer it is, the more gain you get. But even if the antenna is short, it will do better than a dipole or an inverted Vee installed on the same length lot because it will have twice as much wire in it, more gain, and more space diversity.

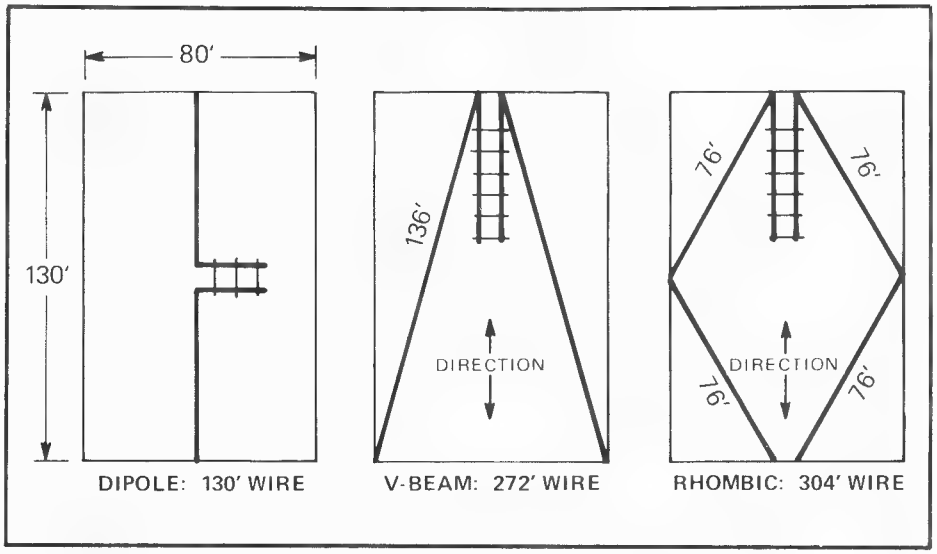

Fig. 1 - Wire antennas placed on a typical small city lot. Of course, dimensions will vary.

Leg Length in Wavelengths	Gain	Optimum Apex Angle
1	3.0 dB	90°
2	4.5 dB	70°
3	5.5 dB	57°
4	6.5 dB	47°
5	7.5 dB	43°
6	8.5 dB	37°
7	9.3 dB	34°
8	10.0 dB	32°

Table I - A chart of gain and optimum apex angles.